

# Hydro Forecaster: Groundwater Level Predictor

This presentation details the progress of the Hydro Forecaster internship project.

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Organization: Xebia

## Organization Overview: Xebia

Xebia is a global IT consultancy and training provider, renowned for its expertise in cutting-edge technologies.

- Specialises in software engineering, cloud, DevOps, AI, and data analytics.
- Operates across multiple countries, serving a diverse global client base.



Known for delivering innovative and high-quality software solutions.

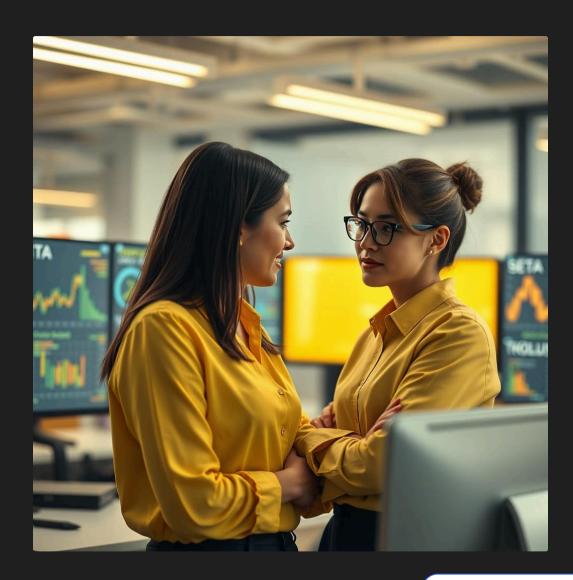
### **Mentor Details**

#### Roshi Saxena

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Guided the project through critical phases:

- Data preprocessing techniques.
- ML model design and architecture.
- Deployment strategies for the application.



## Internship Objectives

1

**Predict Groundwater Levels** 

Utilise machine learning models for accurate forecasting.

2

**Develop Web Application** 

Create a user-friendly interface for predictions.

3

Apply Advanced ML Models

Implement LSTM for time-series and XGBoost for classification.

4

Solve Real-World Challenges

Address environmental data complexities in forecasting.

### Tasks Undertaken

### **Data Collection & Preprocessing**

Gathered data from Telangana groundwater sources, followed by cleaning and K-Means clustering.

### **Model Training**

Trained LSTM for monthly forecasts and XGBoost for manual input predictions.

### Feature Engineering

Developed relevant features from weather parameters.

### Web App Development

Designed and tested the Streamlit-based web application.

# Key Learnings & Challenges

### Learnings

- Handling real-world datasets.
- Clustering without predefined labels.
- End-to-end ML pipeline deployment.

### Challenges

- Addressing missing target variables.
- Managing inconsistent and incomplete data.
- Tuning LSTM for high accuracy.

# Progress Till Date



#### **Data Processing**

Preprocessing and clustering phases are fully completed.



#### **LSTM Model**

Trained for 6-month groundwater level forecasts.



#### **XGBoost Classifier**

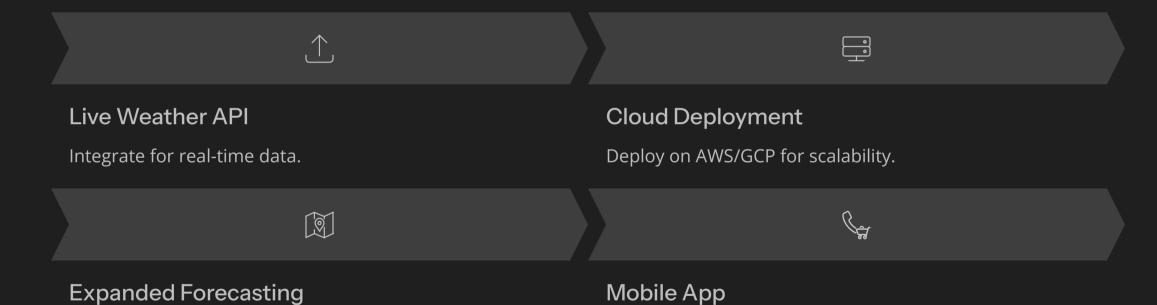
Functional for weather-based predictions.



#### Streamlit Web App

Fully functional and tested locally.

### **Future Plans**



Include district/state-level predictions. Develop for farmers and field officers.

### Thank You

Gratitude to Xebia, SPSU, and my mentor for their invaluable support.

Hydro Forecaster aims to assist in sustainable water management.

Questions and discussion are welcome.

